-METASYS®

Output Relay Momentary Function Module

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Introduction

Description

The Output Relay Momentary (ORM) Function Module is an interface between the DCM and 2-state field devices. This function module provides on/off control of field devices. The ORM features:

- Form A and C relays and interface logic to enable the DCM to control these relays
- Auto/Manual switch (A-M) to enable/disable DCM control
- two momentary pushbutton switches (1 and 0) for manual intervention
- feedback indication of the Auto/Manual switch setting to the DCM

The ORM Function Module plugs into any one of the bottom ten slots associated with the DCM. Figure 1 shows typical function module locations in the NCU. A five slot panel is pictured.

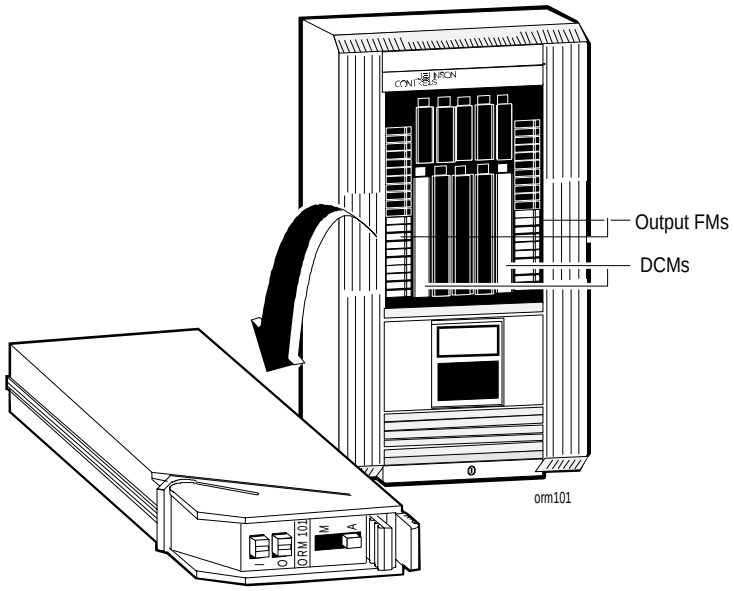

Figure 1: ORM Function Module Locations

Application

The ORM Function Module is typically used for control of:

- motor starters using a start/stop station (3-wire)
- lighting contactors

Capabilities

Table 1: ORM Function Module Capabilities

Capability	Description	Purpose
Input from DCM	DCM inputs a digital command.	Allows DCM to provide automatic control of outputs.
Auto/Manual Switch and Two Momentary Pushbutton Switches	Switch selects one of - Auto—DCM/relay control of outputs. - Manual—DCM/relay control disabled. Pushbutton switches provide override control of output in both Auto and Manual modes.	Allows for manual override of DCM control for special situations. Allows for local/manual control, even if the DCM is not present.
Power on Reset	At low power or after power up, relay is de-energized.	Provides controlled restart.
Output to Field	Module provides contact closure control on three leads with respect to a common lead: - Relay A (Form A type) N.O. lead - Relay B (Form C type) N.O. lead - Relay B (Form C type) N.C. lead	Provides contact closure control of field devices.

Theory of Operation

Figure 2 is a functional diagram of the ORM Function Module.

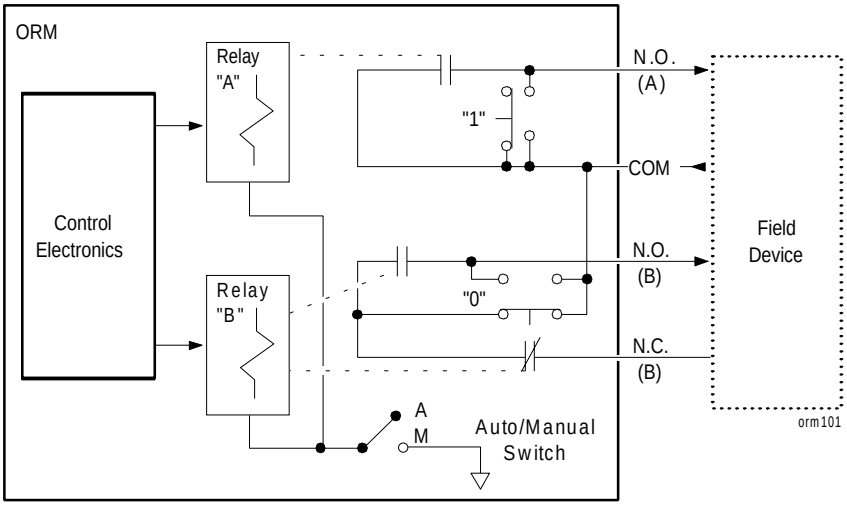

Figure 2: ORM Function Diagram

Under DCM control, the process is:

- The DCM provides a control signal to the ORM to independently control the two relays in the ORM. Typically, the signal provides start and stop commands for a motor.
- The control electronics momentarily energize the appropriate relay.
- When Relay A is energized, its contacts close the circuit that starts a motor or energizes a lighting relay.
- When Relay B is energized, its pair of contacts change state. One set may open a circuit to stop a motor, or the other set may close a circuit to de-energize a lighting relay.

Manual controls are:

- an Auto/Manual switch (A-M) that can disable the DCM control of the ORM relays. The status of this switch is reported back to the DCM.
- a momentary pushbutton (1) that closes the same circuit as the Relay A contacts
- a momentary pushbutton (0) that closes and opens the same pair of circuits as the pair of Relay B contacts

The two pushbuttons operate with the Auto/Manual switch in either position. The pushbuttons mechanically control the circuits and work even if the NCU or NEU is not powered up.

Specifications

Table 2: ORM Function Module Specifications

Category	Specifications For Configurations
Product Code Number	FM-ORM101
Output Range	Two states (contact open/closed) on each of three leads
Output Limits	1 amp
Output Protection	Common output fused at 3 amps with a slow blow, non-field replaceable fuse.
Relay Type	Form A relay having a Normally Open (N.O.) contact. Form C relay having a Normally Open (N.O.) and Normally Closed (N.C.) contact with a common connection between them. Contacts are "break-before-make" type.
Relay Contact Rating	120 VAC, at 1 amp max., pilot duty
Relay Insulation Resistance	1,000 M ohms (min.) from contacts to coil
Relay Dielectric Strength	2,000 VAC, 50/60 Hz, (for 1 min.) from contacts to coil 1,000 VAC, 50/60 Hz, (for 1 min.) between N.O. and N.C. contacts
Relay Service Life	Mechanical: 10,000,000 operations Electrical: 300,000 operations for inductive load at 120 VAC, at 1 amp with a power factor of 0.4
Response Time	Maximum: 100 msec
Default Condition	At low power or after power up, relay is de-energized.
Source Power	Power is from the PWR in the NCU/NEU.
Operating Environmental Requirements	32 to 122°F (0 to 50°C) 10 to 90% noncondensing RH 86°F (30°C) maximum dew point
Storage/Shipping Environmental Requirements	-40 to 158°F (-40 to 70°C) 5 to 95% noncondensing RH 86°F (30°C) maximum dew point
Size	0.85 in. H x 2.6 in. W x 7.0 in. L (2.2 cm H x 6.6 cm W x 17.8 cm L)
Weight	0.5 lb (0.22 kg)
Agency Compliance	FCC Part 15 Subpart J—Class A, UL 916, CSA C22.2 No. 205
Agency Listings	UL Listed and CSA Certified as part of Metasys®

Installation Procedures

General Information

When installing and connecting function modules:

- follow NEC and local codes
- observe maximums as specified in the specification table and in these installation guidelines

3-Wire Motor Starter

Figure 3 diagrams the wiring for 3-wire motor starter applications using the ORM Function Module.

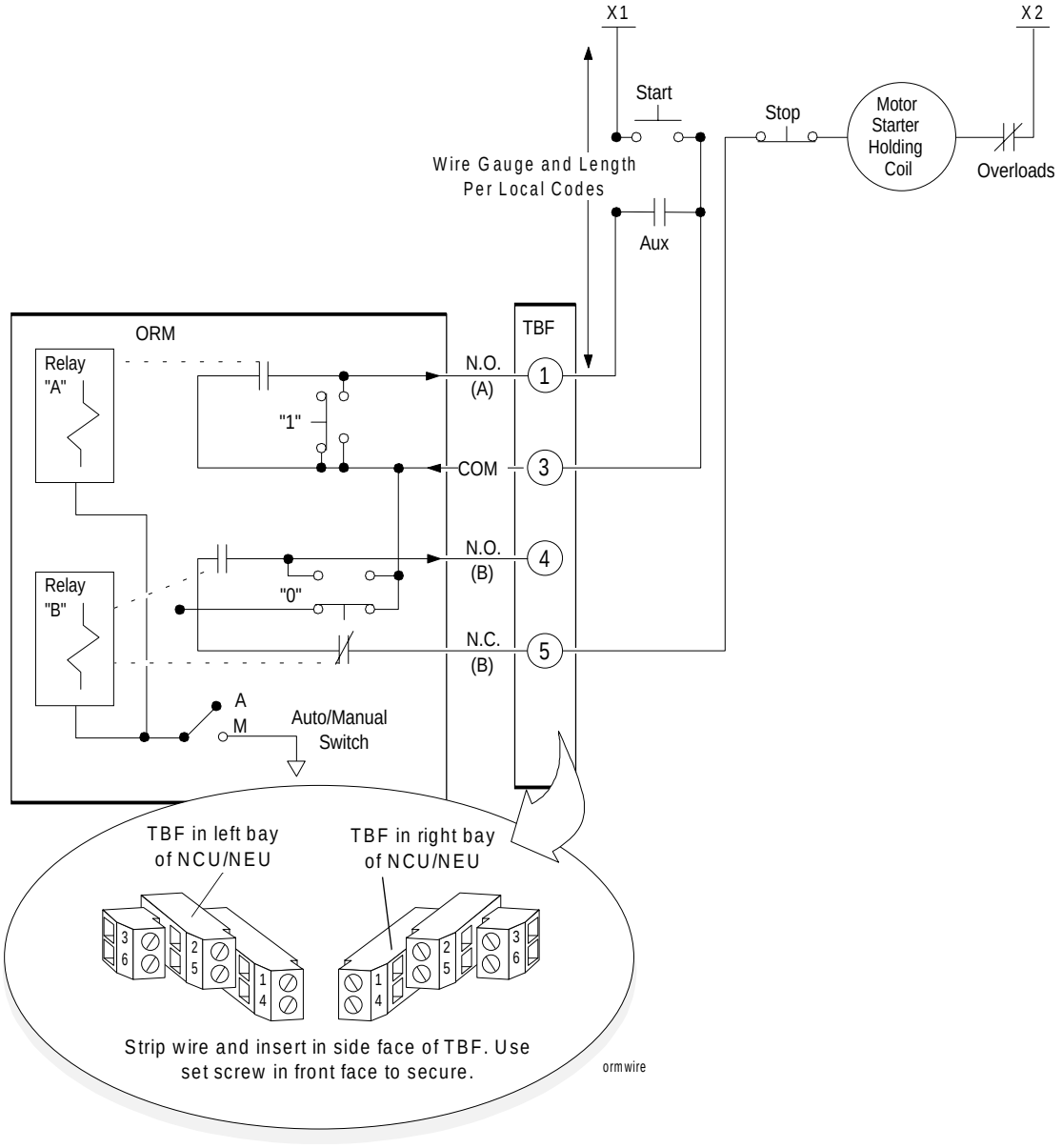

Figure 3: Wiring for 3-Wire Motor Starter Application

Lighting Control

Figure 4 diagrams the wiring for lighting control applications using the ORM Function Module.

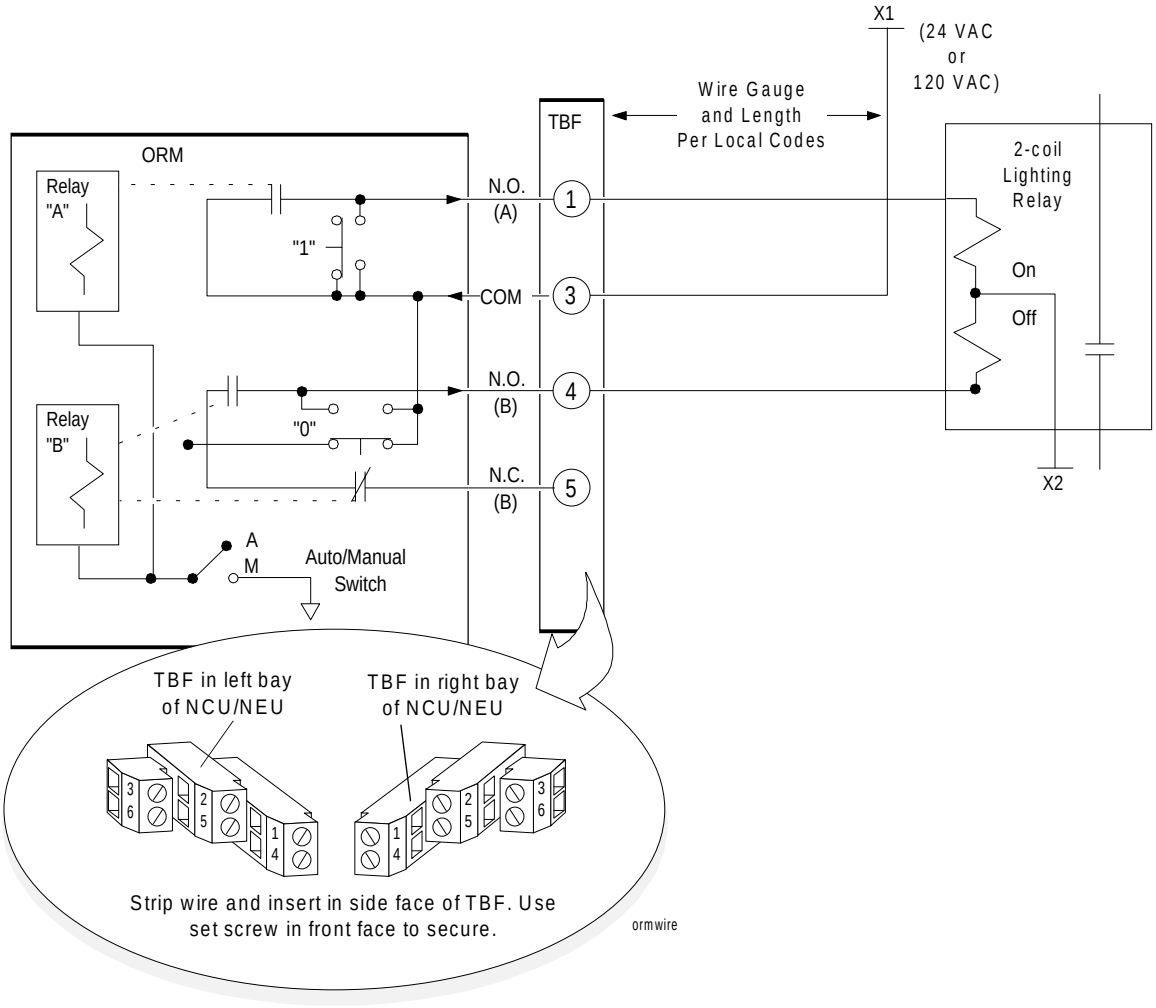

Figure 4: Wiring for Lighting Control Application

Physical Installation

Assumptions

The following procedure for the physical installation of the ORM Function Module assumes:

- Panel (NCU or NEU) is installed.
- Connections to field devices are complete.
- You have engineering drawings defining details for the installation.
- You are familiar with Metasys Network terminology, and the location and operation of power switches.

Procedure

For each ORM Function Module in the network, perform the following steps.

1. Set the Auto/Manual switch to manual.
2. Refer to the engineering drawings, and identify the proper panel and slot number location for this module.
3. Open the latch.
4. Insert the module in the appropriate slot.
5. Close latch, locking function module in place.

Commissioning Procedures

Physical Verification

Assumptions

The following procedure for the physical verification of the ORM Function Module assumes:

- Physical installation at the NCU/NEU panel is complete.
- Power is available at the panel power supply, and at the field device.

Procedure

For each ORM Function Module in the network, perform the following steps.

1. Power up the appropriate DCM power supply.
2. Press Switch 1 on the ORM. Verify that the appropriate device is activated, as defined in the engineering drawings.
3. Press Switch 0 on the ORM. Verify that the appropriate device is activated and/or that the appropriate device is deactivated as defined in the engineering drawings.

Software Verification

Assumptions

The following procedure for the software verification of the ORM Function Module assumes:

- Physical installation at the NCU/NEU panel is complete, including NCM, DCM, FM, etc.
- The operating software for the network has been downloaded to the NCM controlling the panel.
- An Operator Workstation is available.

Procedure

For each ORM Function Module in the network, perform the following steps.

1. Select the system summary that includes this ORM object.
2. Set Auto/Manual switch on the ORM to Auto.
3. Adjust the software override command and verify that the object's Value attribute (as seen in the Summary) matches the actual value for the field device.

Troubleshooting Procedures

Troubleshooting Chart

Use the diagram in Figure 5 (next page) as a troubleshooting guide. It applies for failures between point objects and field devices connected through an ORM Function Module.

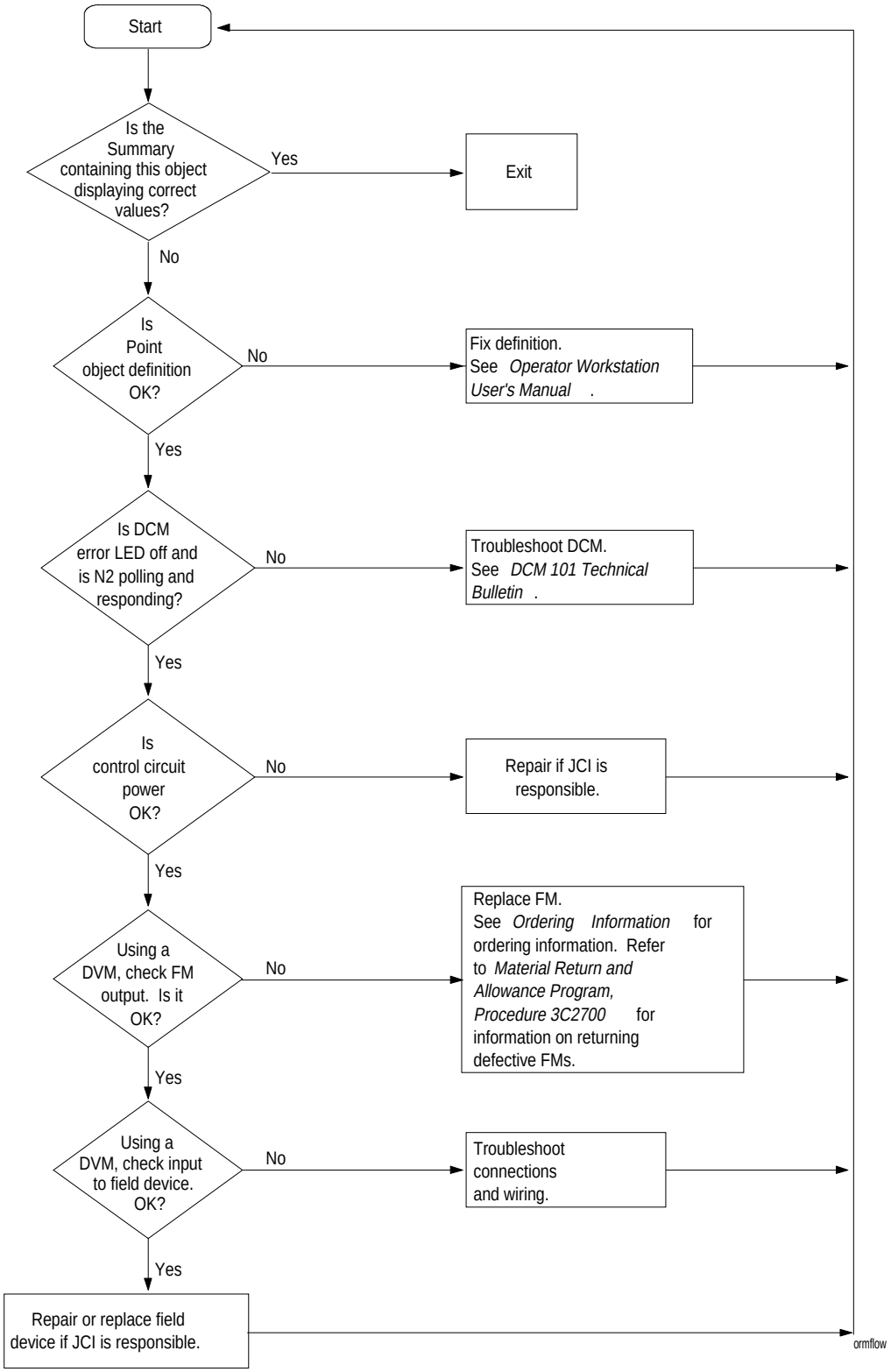
Start
Is the Summary containing this object displaying correct values?
Yes
Exit
No
Is Point object definition OK?
No
Fix definition. See Operator Workstation User's Manual .
Yes
Is DCM error LED off and is N2 polling and responding?
No
Troubleshoot DCM. See DCM 101 Technical Bulletin .
Yes
Is control circuit power OK?
No
Repair if JCI is responsible.
Yes
Using a DVM, check FM output. Is it OK?
No
Replace FM. See Ordering Information for ordering information. Refer to Material Return and Allowance Program, Procedure 3C2700 for information on returning defective FMs.
Yes
Using a DVM, check input to field device. OK?
No
Troubleshoot connections and wiring.
Yes
Repair or replace field device if JCI is responsible.
ormflow

Figure 5: ORM Troubleshooting

Ordering Information

Table 3: Ordering Information

Description	Product Code Number
ORM Function Module	FM-ORM101-0

Notes

JOHNSON CONTROLS

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